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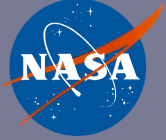
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California Institute of Technology  
Pasadena, California

# AIRS Science Processing Software

**Version 4.0 Status**  
**Version 5.0 Strategy and Goals**

**Steven Friedman**  
**AIRS Science Processing**

**November 30, 2004**



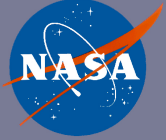
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## Version 4 Status Update

- **Version 4 software development complete – stabilized**
- **Validation data processing completed**
  - Two 16-day segments: Level 0 through Level 3
  - Two-years Match-Up: Fixed Validation Sites
- **Verification and Validation Underway**
  - Verification by software testers
  - Validation by Validation Team
- **Final build planned for mid-December**
  - Set final quality flags, remaining critical anomalies
  - Dependent on preliminary validation assessment
- **Delivery to GSFC DAAC and NOAA during December**



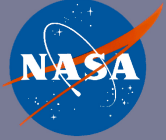


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## Version 4 Timeline

| – Activity –               | – Dates –             |
|----------------------------|-----------------------|
| Coding Complete            | November 1, 2004      |
| Validation Data Processing | November 8 – 26, 2004 |
| Preliminary Validation     | December 6 – 10 2004  |
| Final Build                | December 15, 2004     |
| Delivery to GSFC DAAC      | December 23, 2004     |
| DAAC I&T                   | January 2005          |
| Final Validation Report    | January 31, 2005      |
| Version 4.0 Live!          | February 1, 2005      |



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## Standard Product Activation / Validation Timeline

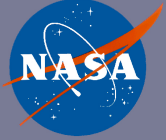
| Version                   | 3.0                  | 4.0        | 5.0    | 6.0    | 7.0    |
|---------------------------|----------------------|------------|--------|--------|--------|
| Activation Date           | 9/15/03              | 2/1/05 rev | 1/1/06 | 1/1/07 | 1/1/08 |
| Radiance Products (L1)    | Ocean                | Land       | Polar  | Global | Global |
| AIRS Radiance             | Prov                 | Val2       | Val3   | Val4   |        |
| VIS/NIR Radiance          | Prov                 | Val2       | Val3   | Val4   |        |
| AMSU Radiance             | Beta                 | Prov       | Val2   | Val3   | Val4   |
| HSB Radiance              | Beta                 | N/A        | N/A    | N/A    | N/A    |
| Standard Products (L2)    |                      |            |        |        |        |
| Cloud-Cleared IR Radiance | Beta                 | Val2       | Val3   | Val4   |        |
| Surface Temperature       | Beta                 | Val1       | Val2   | Val4   |        |
| Temperature Profile       | <del>Beta</del> Prov | Val2       | Val3   | Val4   |        |
| Humidity Products         | Beta                 | Val1       | Val2   | Val3   | Val4   |
| Cloud Cover Products      | N/A                  | Val1       | Val2   | Val3   | Val4   |

Beta = Not suitable for  
scientific investigations.

Prov = Provisionally validated.  
Useable for scientific investigations  
with caution. Validated for non-polar,  
night, ocean only.

Val1 = non-polar, day/night, ocean.  
Val2 = Val1 + land.  
Val3 = Val2 + polar  
Val4 = Global All Cases





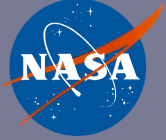
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## Version 4 Features (compared to baseline goals)

- **Standard product file size reduction**
  - Level 1B and Level 2 cloud-cleared radiance files reduced in size by 50%
  - Level 3 files also released in compressed format
- **Level 1A**
  - Continue to produce stable products
  - *No liens*
- **Level 1B**
  - Microwave radiances provisionally validated
  - Infrared and VIS/NIR radiances validated
  - *No liens*

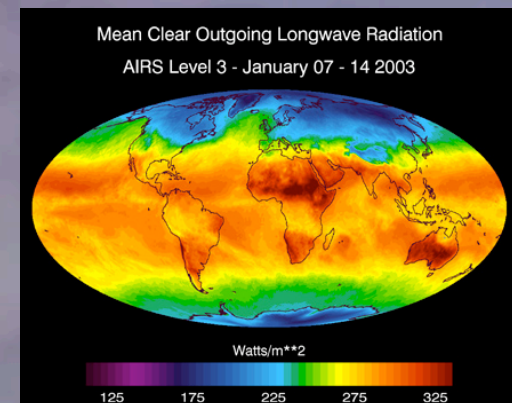


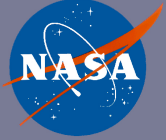


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## Version 4 Features (cont'd.) (compared to baseline goals)

- **Level 2**
  - Extend validation from ocean to land areas
  - Ocean areas
    - No liens
  - Land areas
    - Atmospheric retrievals within guidelines
    - Surface retrievals need improvement
  - Retrievals
    - Validated in accordance to validation table
- **Level 3**
  - Daily, multi-day and monthly products
  - *Beta products – no liens*



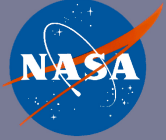


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## Version 5 Objectives

- **Level 1**
  - Improve microwave standard products
- **Level 2**
  - Improved Error Estimation
  - Eliminate (or minimize) IR Tuning
  - IR-only Cloud Clearing
  - Include IR Spectral Emissivity in retrievals
  - Trace Gas Profiles: CO<sub>2</sub>, CO, CH<sub>4</sub>, O<sub>3</sub>, SO<sub>2</sub>, Aerosols
  - Extend validated retrievals to polar regions
  - Consensus clear flag
- **Level 3**
  - Quantization Product (added to existing set)
  - Formal error propagation



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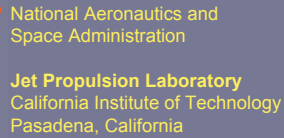
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## Version 5 Methodology Improvements

- **Improved Project and Science Team Coordination**
  - Early definition of goals and objectives
  - Defined requirements and responsibilities
  - Coordinated schedules
  - More CCB involvement
- **Fewer software deliveries**
  - Demonstration of new features prior to incorporation into software baseline
  - Earlier integration into baseline
  - Longer validation period

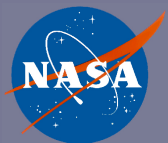






# Schedule

| D  | Task Name                             | Duration        | Start              | Finish            | 2005 |   |   |   |   |   |   |   |   |   |   |   | 2006 |   |
|----|---------------------------------------|-----------------|--------------------|-------------------|------|---|---|---|---|---|---|---|---|---|---|---|------|---|
|    |                                       |                 |                    |                   | J    | F | M | A | M | J | J | A | S | O | N | D | J    | F |
| 1  | <b>V5.0 Development</b>               | <b>340 days</b> | <b>Mon 8/23/04</b> | <b>Tue 1/3/06</b> |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 2  | <b>Preliminary Planning</b>           |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 3  | Concept Development                   |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 4  | Science Team Meeting                  |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 5  | Solidify Requirements                 |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 6  | Finalize contents and tasks           |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 7  | <b>Prototype and Characterization</b> |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 8  | Initial proof of concept              |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 9  | In-Process Status report              |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 10 | Presentation of preliminary res       |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 11 | Final development                     |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 12 | Delivery of code                      |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 13 | <b>Development and Integration</b>    |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 14 | In-house Improvements                 |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 15 | Final Inputs to CCB                   |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 16 | Development and Unit Test             |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 17 | CCB Approval to build 5.0             |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 18 | Initial build and delivery to TDS     |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 19 | Controlled Anomaly Quickfix           |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 20 | TDS SI&T                              |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 21 | TDS end-to-end checkout               |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 22 | <b>Testing</b>                        |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 23 | Operational in TDS                    |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 24 | Sustained Testing                     |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 25 | Validation Data Processing            |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 26 | Preship Review preparation            |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 27 | Preship Review                        |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 28 | <b>Transfer V5.0 to DAAC</b>          |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 29 | Packaging and Shipping                |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 30 | Delivery to DAAC and NOAA             |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 31 | JPL Support to DAAC                   |                 |                    |                   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 32 | DAAC I&T                              | 20 days         | Wed 11/30/05       | Thu 12/29/05      |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 33 | Validation Report Due                 | 0 days          | Wed 12/21/05       | Wed 12/21/05      |      |   |   |   |   |   |   |   |   |   |   |   |      |   |
| 34 | Public Data Release V5.0              | 0 days          | Tue 1/3/06         | Tue 1/3/06        |      |   |   |   |   |   |   |   |   |   |   |   |      |   |



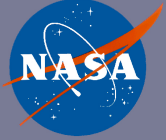
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## V5 Key Activities

| – Activity –  | – Dates –   |
|---|---|
| <b>Conceptualization</b><br><b>Prototype and characterization</b><br><b>Delivery of code</b><br><b>JPL integration and test</b> | <b>Through December 2004</b><br><b>Through May 2005</b><br><b>No later than June 27, 2005</b><br><b>June – September 2005</b> |
| <b>Operational in TDS</b><br><b>Validation data processing</b>  | <b>October 2005</b><br><b>Ends mid-November 2005</b>  |
| <b>Delivery to GSFC DAAC</b>  | <b>End of calendar year 2005</b>  |





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